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Digital Textbooks
An Overview

Digital Textbooks are electronically-accessed resources. The two primary types of digital textbooks are e-textbooks and open source textbooks. Digital textbooks might be purchased from traditional textbooks publishers as "e-textbooks," or they might have been authored as "open source." Open sources can refer to materials developed collaboratively or by a single author, but they are made available freely for use, remixing, and redistribution.

Open Educational Resources (OER) Philosophy: Change is needed in order to equalize access to high-quality academic content and encourage worldwide use [supported by United Nations Educational, Science and Cultural Organization (UNESCO) and William and Flora Hewlett Foundation].

OER Stakeholders:

Governments:

- a) Expanding access to learning and reaching non-traditional learners;
- b) Promoting lifelong learning;
- c) Bridging the gap between formal, informal and non-formal learning.

Institutions:

- a) Sharing knowledge is congruent with the academic tradition;
- b) Taxpayers' money is leveraged through the free sharing of resources;
- c) The cost of content development can be reduced and quality may be improved;
- d) The public image of the institution may be enhanced and new students attracted;
- e) With increasing competition, institutions need to identify new cost-recovery models.

Educators:

- a) Sharing is an academic value;
- b) Personal gain through increased reputation;
- c) Gaining publicity or reaching the market more quickly may result in an economic advantage.

Potential Barriers:

- a) *Technical*, such as lack of broadband access¹;
- b) *Economic*, such as inadequate resources to invest in the necessary software and hardware; as well as overall management of an OER system.
- c) *Social*, such as a lack of the skills needed to use technology;
- d) *Policy-oriented*, such as the lack of academic recognition of the development of OER by teaching staff; SCORM-compliant digital objects.
- e) *Legal*, such as the time and expense associated with gaining permission to use third-party owned copyrighted materials or its removal from material.

¹ Education Week's 2009 "Technology Counts" report gives Louisiana a perfect score of 100 and an A in its Use of Technology in the classroom. This may less of an issue for our state.

Economic Sustainability:

- a) *Endowment model* - raised funding
- b) *Membership model* - interested organizations contribute seed money and/or charge for an annual subscription
- c) *Donations model* - from the community of users
- d) *Conversion model* - free basic product, but pay for advanced services
- e) *Contributor-pay model* - content contributor covers the cost of maintaining their contribution in a freely accessible repository
- f) *Sponsorship model* - company sponsors in return for positive publicity
- g) *Institutional model* - financing through regular budget to fulfill its mission
- h) *Government model* - funded project to fulfill specified objectives such as expanding access to education and learning opportunities for its citizens
- i) *Partnerships and exchanges* - reliance more on exchange of resources rather than exchange of funds.

The OER concept resembles the SCORE Initiative of the Southern Regional Education Board.²

PROS:

- a) Provides an exciting innovation in terms of providing world-wide collaboration toward a globally shared knowledge base that could be aligned with common core academic standards;
- b) Reintroduces valuable information otherwise 'lost' within the digital archives of the public domain;
- c) Digital textbooks (e-textbooks and OER are growing in popularity);
- d) Introduces new modes for teaching and learning (individual and multi-player games, simulations);
- e) Does not prohibit the use and reuse of information as does copyright protected, and proprietary information;
- f) Current OER projects exist, such as internet archives (e.g., special collections, public service announcements, archived digital information dating back to 1927 within the public domain), Connexions, Nupedia/Wikipedia, Flickr, WikiEducator, Cape Town Open Education Declaration: 'taxpayer-funded educational resources should be open education resources.' See also, www.fas.org/babylon/www.sciencedaily.com/releases/2005/06/050627062144.htm; www.fas.org/immuneattack; and resources used by the *Louisiana Virtual School*.³

CONS:

- a) Utility of OER is reliant upon the vision and leadership for its place within the educational setting;
- b) Research which supports the use of OER as an effective teaching or learning tool may be limited;
- c) Content may be 'free' but actual direct costs show up in terms of start-up and sustained self-maintenance costs of the required infrastructure (e.g., equipment, software, on site printing) along with ongoing, job-embedded staff development;
- d) Accessibility: Costly conversions of ever-changing information make OER less desirable for *prescribed* use. Core and core related information defined as the general curriculum must be made *accessible* to all students including those with print disabilities. Appropriate formats required for every child – e.g., Print, Braille, Audio, Large Print, and/or Digital
- e) 50 state-specific content standards make OER less usable *globally*.

Sources:

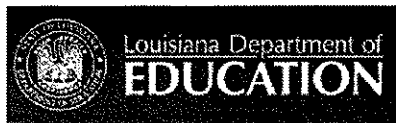
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Cisneros, Noe M. (2009). State Initiatives Regarding Electronic or Open Source Textbooks. ECS StateNotes, Textbooks, pp. 1-8.

² Enclosure: SREB, Principles of Effective Learning Objects, March 2005.

³ Enclosure: Brochure



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FOR IMMEDIATE RELEASE**Date:** 4/1/2009**Contact:** Rene' Greer, (225) 342-3600, Fax: (225) 342-0193

LOUISIANA'S USE OF EDUCATIONAL TECHNOLOGY RANKS AMONG HIGHEST IN COUNTRY

BATON ROUGE, La. – According to a recent report, Louisiana is a national leader in its application of technology to enhance both learning and teaching.

Education Week's 2009 "Technology Counts" report gives Louisiana a perfect score of 100 and an A in its *Use of Technology* in the classroom. Eight other states – Arizona, Georgia, Maryland, North Carolina, South Carolina, South Dakota, Utah and West Virginia – also earned perfect scores and therefore share the number one designation with Louisiana.

"Our student population is extremely comfortable with technology, and in fact is heavily reliant on technology to communicate and function in most areas of their life," said State Superintendent of Education Paul Pastorek. "With that in mind, we are working to leverage the potential classroom applications that technology offers us as a resource for both teachers and students. We are pleased that the findings of the report validate our existing programs, and we will use this information to help guide future decisions and improvements around the use of technology to raise student achievement."

To derive at each state's grade in the *Use of Technology*, Education Week evaluated whether or not states had established a virtual school and if and to what degree states are including technology in student standards, testing students on technology and offering computer-based assessments. In the same category last year, Louisiana scored a 90 and was ranked 5th in the nation with 11 other states.

In the *Capacity to Use Technology* category, Louisiana earned a B grade. And along with 12 other states, Louisiana earned a score of 86.3 and ranked 4th behind Georgia, West Virginia and Kentucky. This is the same grade and ranking the state earned in this category last year, although the state's 2009 score was slightly higher than its 2008 score of 86. The national average grade in the category for *Capacity to Use Technology* was a C-plus.

Policies evaluated under *Capacity to Use Technology* include: incorporating technology in teacher and administrator standards; including technology in initial teacher license requirements and initial administrator license requirements; including technology in teacher recertification requirements; and including technology in administrator recertification requirements. Louisiana has all of the policies in place with the exception of requiring technology in initial administrator licensing and

teacher recertification.

A third category, *Access to Technology*, was not included in the 2009 edition of "Technology Counts" because of a lack of consistent data across all states. Therefore, overall grades and rankings were also discontinued this year. The access category may be updated in coming years to measure not only access to computers, but use of whiteboards, access to high-speed internet and other technology in classrooms. Last year, when the access category was still computed and overall rankings were determined, Louisiana was ranked 8th in the nation overall and earned a grade of B-.

The "Technology Counts" recognition is not the only acclamation Louisiana has received recently for technology in education. Late last year, the Center for Digital Education ranked the state's virtual school 5th in the nation for its policies and practices for online learning. The Louisiana Virtual School was established more than nine years ago and has continued to build on the standards-based high school courses it initially offered – growing from 24 courses offered the first year to more than 60 courses this year.

"Computer technology will never take the place of a highly-qualified and supportive teacher, but used in an appropriate way, technology can undoubtedly enrich the educational experience of our students as well as the opportunities available to them," Board of Elementary and Secondary Education President Keith Guice said. "I am reassured by this report that we are utilizing technology in the right ways to benefit our students and support our teachers and staff."

In addition to the perfect score Louisiana received for *Use of Technology*, some of the other significant findings in the report include:

- Louisiana is one of only 13 states that tests students on technology.
- The Louisiana Virtual School is one of 29 in the nation.
- Out of 50 states and Washington, D.C., Louisiana is one of 21 states that include technology in initial teacher license requirements.
- In 2007, 85 percent of school districts in the nation reported having interactive whiteboards. The 2008 "America's Digital Schools" report, cited in "Technology Counts," projects that by 2010 that statistic will have increased to 95 percent.
- The same report says 27 percent of school districts across the country had a 1:1 student to computer ratio for computing in 2007, but that number is projected to increase to 50 percent by 2010.
- In the United States, the number of K-12 public school students using online courses increased by 47 percent from the 2005-2006 school year to the 2007-2008 school year. More than 1 million students took an online course in 2007-2008. And, unlike years past, online, virtual courses are being targeted at advanced students *and* struggling students across the country.
- One of the biggest growth trends has been in the number of states that offer on line credit recovery for students who have failed or not completed a course needed for graduation. Louisiana is among the states offering credit recovery through virtual learning.

The "Technology Counts" report is available online at www.EdWeek.org.

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Applicable Existing Statute and BESE Policy

Title 17

§351. Free school books and other materials of instruction

A.(1) The State Board of Elementary and Secondary Education shall prescribe and adopt school books and other materials of instruction, which it shall supply without charge to the children of this state at the elementary and secondary levels out of funds appropriated therefor by the legislature in accordance with the requirements of Article VIII, Section 13(A) of the Constitution of Louisiana.

(2) The State Board of Elementary and Secondary Education shall prescribe and adopt those school books and other materials of instruction which accurately reflect the contributions and achievements of people of differing races.

(3) The State Board of Elementary and Secondary Education shall prescribe and adopt those school books and other materials of instruction which promote an understanding of the history and values of the people of the United States and Louisiana, including the free enterprise system, private property, constitutional liberties, democratic values, and traditional standards of moral values.

B. The board also shall prescribe and supply schoolbooks and other materials of instruction for use by students attending vocational-technical schools and programs under the jurisdiction of the board.

C.(1) The board shall establish rules and procedures for supplying schoolbooks and other materials of instruction approved by the State Board of Elementary and Secondary Education as required by this Section for children participating in any home study program approved by the board when available. Such rules and procedures shall include but not be limited to a requirement that any schoolbooks and other materials of instruction provided pursuant to this Subsection shall be made available only to the child or children of the parent or legal guardian obtaining approval for a home study program.

(2) The board shall provide a copy of such rules and procedures to any parent or legal guardian applying for approval of a home study program.

Acts 1975, No. 646, §1; Acts 1991, No. 338, §1; Acts 1993, No. 299, §1, eff. June 2, 1993.

Bulletin 1794

Chapter 3. General Provisions

§301. Definitions

...

Instructional Materials—limited to items having intellectual content that by design assist in the instruction of a subject or course. Instructional Materials may be transmitted via "storage mechanisms" (such as CD-ROMs, DVDs, flash drives, etc.), but "delivery mechanisms" (such as iPods, laptops, whiteboards, etc.) shall not be included in the adopted materials. Instructional Materials may be available in bound, unbound, bundled or package form and may consist of hardbound or softbound textbooks, consumables, manipulatives, electronic media, and computer courseware or software. Instructional Materials do not include electronic or computer hardware even if such hardware is bundled with software or other electronic media, nor does it include equipment or supplies.

...

National Instructional Materials Accessibility Standard (NIMAS)—given that term in Section 674(e)(3)(B) of the Act (NIMAS means the standard established by the secretary to be used in the preparation of electronic files suitable and used solely for efficient conversion into specialized formats).

...

Textbook—any medium or material (print or non-print), book, or electronic medium that constitutes the principal source for teaching and learning in a specified subject area. A textbook shall be a systematically organized core of stand alone instructional materials (which may be hardbound, softbound, electronic or other media) designed to support the teaching and learning of a curriculum based on the SBESE-approved Grade-Level Expectations or state curricular guides (e.g., home economics, foreign language, health, business education). These materials shall be limited to *instructional materials* (see definition herein).

...

AUTHORITY NOTE: Promulgated in accordance with Article VIII, Section 13(A) of 1984; R.S. 17:7(4); 8-8.1; 172; 351-353; 361-365; 415.1; 463.46.

HISTORICAL NOTE: Promulgated by the Board of Elementary and Secondary Education, LR 25:1436 (August 1999), repromulgated LR 26:992 (May 2000), amended LR 32:1030 (June 2006), LR 33:636 (April 2007), repromulgated LR 34:64 (January 2008), amended LR 35:646 (April 2009).

§315. Establish Criteria and Procedure for Evaluation and Selection of Textbooks and Materials of Instruction

A. The following SBESE-approved definition shall serve as a framework for the review of textbooks and materials of instruction which are offered for adoption.

1. A *State-Approved Textbook* is a systematically organized core of instructional materials (which may be hardbound, softbound, electronic or other media) designed to support the teaching and learning of a curriculum based on the State-approved Grade-Level Expectations and state assessment as approved by the SBESE. This definition includes any medium or material (print or non-print), book, or electronic medium that constitutes the principal source of study for teaching in specified subject areas.

...

AUTHORITY NOTE: Promulgated in accordance with Article VIII, Section 13(A) of 1984; R.S. 17:7(4); 8-8.1; 172; 351-353; 361-365; 415.1; 463.46.
HISTORICAL NOTE: Promulgated by the Board of Elementary and Secondary Education, LR 25:1440 (August 1999), repromulgated LR 26:996 (May 2000), amended LR 32:1031 (June 2006).

§505. Local Implementation

A. Adequate and Appropriate Instructional Materials

...

2. Textbooks for Core Curriculum Areas

...

d. Access. A school system shall, based on input from local teachers, principals, administrators, and others, determine how access to textbooks in core subject areas will be made available to students. School systems must ensure that each child within the classroom will have equal access to any available instructional materials. School systems shall also inform each parent/guardian in writing at the beginning of each school year of the method of access to textbooks which has been selected for each course or grade level. A contact person and phone number should be provided.

i. Options for providing textbook access for students may include:

- (a). textbooks provided for each student to take home.
- (b). textbooks provided via a classroom set;
- (c). textbooks provided as both a classroom set and take home copy for each student; or
- (d). other specified arrangement as deemed appropriate to the subject area by local officials.

AUTHORITY NOTE: Promulgated in accordance with Article VIII, Section 13(A) of 1984; R.S. 17:7(4); 8-8.1; 172; 351-353; 361-365; 415.1; 463.46.
HISTORICAL NOTE: Promulgated by the Board of Elementary and Secondary Education, LR 25:1442 (August 1999), repromulgated LR 26:998 (May 2000), amended LR 32:1031 (June 2006).

§723. Braille Accessibility

(R.S. 17:1985; SCR 15 of 1997; SCR 149 of 1997)

A. SCR15 of the 1997 Regular Session requires the State Board of Elementary and Secondary Education (SBESE) to coordinate a statewide system of providing Braille books to visually-impaired students by tracking Braille books already available and supplying funds for those needed. In addition, SCR 149 of the 1997 Regular Session provides for access and use of technology by blind and visually impaired students.

B. Publishers shall furnish, within 90 days of state adoption, to the National Instructional Materials Access Center electronic files containing contents of the print instruction materials using the NIMAS.

AUTHORITY NOTE: Promulgated in accordance with Article VIII, Section 13(A) of 1984; R.S. 17:7(4); 8-8.1; 172; 236; 351-353; 361-365; 415.1; 463.46.

HISTORICAL NOTE: Promulgated by the Board of Elementary and Secondary Education, LR 25:1449 (August 1999), repromulgated LR 26:1005 (May 2000), amended LR 33:637 (April 2007).

Digital Textbooks

Digital textbooks are electronically accessed resources. The two primary types of digital textbooks are **e-textbooks** and **open source textbooks**. Digital textbooks might be purchased from a traditional textbooks publishers as “e-textbooks,” or they might have been authored as “open source.” Open sources can refer to materials developed collaboratively or by a single author, but they are made available for free.

Qualities	Open Source Textbooks	E-Textbook	E-Textbooks in Louisiana
Affordability	<ul style="list-style-type: none"> • Are free to view online • Some are viewed with ads to subsidize costs • Ad can be removed with minimal fee 	<p><u>Course Smart</u> states on their home page that current average savings per e-textbook purchased is \$62.29</p> <p>According to the Allen study</p> <ul style="list-style-type: none"> • E textbooks surveyed were “exactly the same” price as new traditional textbooks bought and sold back to book store • On average, e-textbooks surveyed were twice the cost of a used traditional textbook bought and sold back to bookstore • On average e-textbooks surveyed were 39% more than the cost of a used traditional textbook bought and sold back online 	<ul style="list-style-type: none"> • Most print textbooks include its electronic version free with purchase. • Online subscriptions are made available and provide ongoing updates to approved materials. • State contracts secure pricing for 7 years
Printability	<p>Some are free to print: others charge minimal fees by chapter or by the book. For example, open source company <u>Flat World Knowledge</u> charges:</p> <ul style="list-style-type: none"> • \$19.95 to self print • \$29.95 for black and white version • \$59.95 for color version • \$39.95 for audio version 	<p>Course Smart-e-textbooks:</p> <ul style="list-style-type: none"> • May be printed 10 pages at a time from online or downloadable version • Are limited to printing 150% of the pages in book. For example, books containing 200 pages can have 300 pages printed. • According to the Allen study: • Printing is limited to approximately 10 pages per log in session not necessarily referring to Course Smart 	<ul style="list-style-type: none"> • Printed textbook is already available, with print option of electronic version standard.
Accessibility	<ul style="list-style-type: none"> • Unlimited access to webpage where open source textbook is hosted • Downloadable in multiple formats such as Kindle Reading Device (fee), CD, or PDF on computer drive 	<ul style="list-style-type: none"> • Can be viewed either online or downloaded to a single computer or device such as the iPhone, but not both. • Generally, the subscription periods last between 180 and 540 days depending on the subject. 	<ul style="list-style-type: none"> • Once purchased, e-textbooks are accessible for the life of the adoption contract. • LEA has implementation options based on student need and district leadership (see Bulletin 1794, Section 315). • NIMAS legislation provides alternate formats for eligible students with print disabilities (see Bulletin 1794, Sections 301 & 723). • Assistive Technology devices which access print are made available to eligible students
Availability	<p><u>Connexions</u>, a global repository of educational content, currently has 911 collections (open source textbooks) and 14,942 modules (sections of textbooks broken down to allow instructors to modify and move content easily). Modules piece together to form collections.</p>	<p><u>Course Smart</u> currently has 7, 323 titles in 949 course areas across 113 disciplines from 14 major publishers.</p>	<ul style="list-style-type: none"> • Core and core-related print versions under state contract for 7 years • Alternate formats (Braille, Audio, Large Print, Digital) are made available to students deemed eligible.

Digital Textbooks

Digital textbooks are electronically accessed resources. The two primary types of digital textbooks are **e-textbooks** and **open source textbooks**. Digital textbooks might be purchased from a traditional textbooks publishers as "e-textbooks," or they might have been authored as "open source." Open sources can refer to materials developed collaboratively or by a single author, but they are made available for free.

Qualities	Open Source Textbooks	E-Textbook	E-Textbooks in Louisiana
Features and Benefits	<ul style="list-style-type: none"> • Word search • Copy and paste options • Paper saving • Shipping cost savings as compared to traditional textbooks • Flash cards (fee) • Ancillary study guides (fee) 	<ul style="list-style-type: none"> • Word search • Copy and paste options • Paper saving • Shipping cost savings as compared to traditional textbooks • Note taking functions • Highlighting functions • Matched content and page numbers of traditional textbooks 	<ul style="list-style-type: none"> • Word search • Copy and paste options • Paper saving • Shipping cost savings as compared to traditional textbooks • Note taking functions • Highlighting functions • Matched content and page numbers of traditional textbooks • Content and structure mirror state-approved print versions • Align with state standards, expectations, and benchmarks
Newest features becoming available on e-textbooks	<ul style="list-style-type: none"> • Auto summarize: identifies key points in text by analyzing frequency of words in text • Online dictionary and thesaurus • Text to speech relays text in digital text to speech • Readability statistics: measures how easily an individual can read text • Change of font type • Change of font size • Background color • Discussion forums • Smartphone access 		

Source: Education Commission of the States*700 Broadway, Suite 810* Denver, CO 80203*303-299-3600*fax 303-296*8332*www.ecs.org* Page 4

Qualities	Open Source Textbooks	E-Textbook	E-Textbooks in Louisiana
Challenges	<ul style="list-style-type: none"> • Paradigm Shift – Structure of teaching and learning • Vetting and approval 50 state standards • Implementation plan • Professional development • Teacher training-There is no teacher edition • Funds for digital devices (laptops, Kindle, iPod, mp3) • Funds for NIMAS xml files required under IDEA 300.172 • School infrastructure that supports the ongoing use of technology (i.e., broadband access) • Technical support 		<ul style="list-style-type: none"> • Funds for digital resources (laptops, Kindle, iPod, mp3) • School infrastructure that supports the ongoing use of technology (i.e., broadband access) • Technical support

Principles of Effective Learning Objects

Guidelines for Development and Use of Learning Objects for the SCORE Initiative of the Southern Regional Education Board

The purpose of the *Principles of Effective Learning Objects* is to define learning objects in the context of the SCORE (Sharable Content Objects Repository for Education) initiative, identify expectations for SCORE participants' use of learning objects and provide evaluation criteria of effective learning objects. Each school, college, university or state education agency that seeks to provide digital resources to SCORE will be asked to ensure that they comply with these principles.

Learning Objects

Learning objects are digital content that can be used and reused for teaching and learning. They are modular, flexible, portable, transferable (interoperable) and accessible. Learning objects may be used to teach a particular skill or concept, or to provide stimulating thinking and learning experiences for the teacher or student. A learning object, as defined by SCORE, includes digital content, practice activities and assessment tools that are linked to one or more educational objectives and classified in a plan that allows information about the content to be stored and retrieved (metadata schema).

For teaching and learning purposes, effective learning objects use documents, interactivity, graphics, simulations, video, sound and other media tools that go beyond static textbook presentations to engage students in real-world content.

Learning Objects Repository

A learning object repository (LOR) provides faculty, teachers, curriculum developers and students with easy access to a large storehouse of content/learning objects that can be shared and used within and across schools, colleges and universities, and state agencies. The goal of the SCORE project is to provide an accessible online location to store, search and locate accurate and high-quality digital resources.

Use of Principles

- to inform decision-makers, developers and users regarding learning objects;
- to guide the development of digital resources to ensure that characteristics of good teaching and learning materials are addressed;

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- to require review of quality and other attributes of the digital resources by a school, college and university, or state education agency before they are submitted for inclusion in the repository; and
- to ensure at the school, college and university, or state educational agency level that high-quality learning objects are submitted.

Central Assumptions

- The digital resource is provided by or through a school, college or university that is accredited by a recognized accrediting body or by a state education agency that is a participating partner in SCORE.
- SCORE participation and submission of learning objects will be coordinated by the appropriate state education agency or agencies.
- In the absence of state education agency participation, a school, college or university may represent itself or participate within a consortium.
- These principles are generally applicable to all forms of digital content, including print, video and audio.
- Each state must establish procedures to ensure compliance with these principles and share them with the Southern Regional Education Board.
- To have access to the repository, teachers, faculty and others with academic responsibilities must be located in a SREB state and be affiliated with a participating partner that has signed the SCORE Memorandum of Agreement.
- Participating SREB states accept that the inclusion of a learning object in the repository verifies assurance that the learning object meets the *Principles of Effective Learning Objects*.

Criteria for Inclusion in SCORE

Learning objects will be accepted only from schools, colleges and universities, or states that are partners in the SCORE initiative. Partnership is defined as those schools, colleges, universities and state education agencies that have signed and submitted the SCORE Memorandum of Agreement.

SCORE reserves the right to remove any learning object from the repository if it contains errors or raises certain issues (e.g., questionable content, timeliness of the information or intellectual property concerns).

Learning object criteria for inclusion in SCORE are based on the "Learning Object Review Instrument (LORI) User Manual."¹ This manual has been created to effectively review learning

¹ Nesbit, J. C.; Belfer, K. & Leacock, T. "Learning Object Review Instrument (LORI) User Manual." E-Learning Research and Assessment Network, 2003.

objects. Prior to submission to SCORE, each proposed learning object must be reviewed for quality and approved at the school, college and university or state level. The criteria from LORI, adapted here with permission of the author, follow:

- **Content Quality.** The content is free of error and presented without bias or omissions that could mislead learners. Claims are supported by evidence or logical argument. Presentations emphasize key points and significant ideas with an appropriate level of detail. Differences among cultural and ethnic groups are represented in a balanced and sensitive manner.
- **Learning Goal Alignment.** Learning goals are declared, either within content accessed by the learner or in available metadata. The learning goals are appropriate for the intended learners. The learning activities, content and assessments provided by the object align with the declared goals. The learning object is sufficient in and of itself to enable teachers and learners to achieve the teaching and learning goals.
- **Feedback and Adaptation.** The learning object has the ability: (a) to tailor instructional messages or activities according to the specific needs or characteristics of the learner; or (b) to simulate or construct phenomena under study in response to differential input from the learner. Information about the learner is used to determine how the learning object is developed and shared.
- **Motivation.** The learning object is motivating. Its content is relevant to the interests of the intended learners. The object offers choice, true-to-life learning activities, multimedia, interactivity, humor, drama or game-like challenges. It provides realistic expectations and criteria for success. Feedback compares learner performance to the criteria, illustrates the results of the performance and explains how the performance can be improved. Learners are likely to report an increased interest in the topic after working with the learning object.
- **Presentation Design.** The structure and interactive design enable the user to learn efficiently. The presentations minimize visual search. Text is legible. Graphs and charts are labeled and free of clutter. Animated or video-recorded events are described by audio narration. Meaningful headings signal the content of text passages. Writing is clear, concise and free of errors. Color, music, and decorative features are aesthetically pleasing and do not interfere with learning goals.
- **Interaction Usability.** The user interface design implicitly informs learners how to interact with the object, or there are clear instructions guiding use. Navigation through the object is easy, intuitive and free from excessive delay. The behavior of the user interface is consistent and predictable.
- **Accessibility.** The learning object provides a high degree of accommodation for learners with sensory and/or motor disabilities and can be accessed through assistive devices. It follows the "IMS Guidelines for Accessible Learning Applications" and conforms to "W3C Web Content Accessibility Guidelines."

- **Reusability.** The learning object is a stand-alone resource that can be readily transferred to different courses, learning designs and contexts without modification. It operates effectively with a broad range of learners by adapting content or providing additional content such as glossaries and summaries of prerequisite concepts.
- **Standards Compliance.** The learning object adheres to all relevant international standards and specifications. These include the IEEE Learning Object Metadata standards and technical guidelines developed by IMS, IEEE, SCORM and W3C (accessibility guidelines not included). Sufficient standard metadata are provided in tagged code within the object and presented in a page available to users.

The complete “Learning Object Review Instrument (LORI) User Manual” also will serve as a learning object evaluation and assessment instrument based on these criteria.

Facilitating the Use of SCORE Learning Objects

SCORE will assign meta tags to learning objects that are placed into the repository. **Meta tags** are HTML tags that identify the contents of the learning object. Information commonly found in meta tags includes copyright information, searchable keywords, subjects and formatting descriptions.

Metadata is the information about the content that enables it to be stored and retrieved from a database. It is the information *about* the learning object itself — not the information in the learning object. In other words, metadata is *data about the data*. Repository metadata — or Learning Object Metadata (LOM) — provides descriptions of format and attributes of the learning object. It is essential for retrieval, management, maintaining rights and ownership, and interoperability. LOM includes information about the title, author, version number, creation date, technical requirements, and educational context and intent. Both meta tags and metadata are essential to control workflow and dissemination of information from the repository.

The “Users Guide for Entering Meta Data into LOM Fields,” which crosswalks LOM standards between Dublin Core and GEM (Gateway to Educational Materials), has been created especially for this K-20 SCORE initiative. To facilitate the development and use of learning objects at the K-12 level, it has been essential to include GEM subjects (keywords or controlled vocabulary). This guide will serve as a users’ guide for developers and the meta tag specialists.

Elaboration of the Principles

These principles serve as guidelines for schools, colleges and universities, and state agencies to understand learning objects and the requirements for participation in the SCORE initiative. Additional documents will provide more detailed information to train teachers and faculty as they develop and use learning objects.

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